

METHOD FOR FORMING SILICON FILMS WITH TRACE IMPURITIES

ABSTRACT OF THE INVENTION

5 A method is provided for forming silicon films with a
controlled amount of trace impurities. The method comprises:
forming a target including silicon and a first concentration of a first
impurity; supplying a substrate; and, sputter depositing a film of
silicon on the substrate including a second concentration of the first
10 impurity. The first impurity in the target can be a transistion metal,
phosphorous, or germanium. When the first impurity is Ni, the first
concentration of nickel in the target is in the range of 0.01 to 0.5
percentage by atomic weight (at %). Preferably the range is 0.05 to
0.2 at %. Then, the second concentration of Ni in the deposited
15 silicon film is in the range of 0.01 to 0.5 at %.